

WHAT IS CLAIMED IS:

1. A generator comprising:
 - a rotor and stator with a gap between the rotor and the stator, the gap having ends; baffles at the ends of the gap;
 - a substantially hermetically sealed enclosure filled with a gaseous coolant at superatmospheric pressure and including a coolant receiving region, the rotor and the stator positioned in the enclosure;
 - the stator including a core, cooling ducts in the stator core, and windings which form a winding overhang at each end of the stator, the rotor including cooling channels; wherein, when the generator is operating, and when the generator is in fluid communication with a cooling apparatus, gaseous coolant flows in a circuit from the cooling apparatus past the winding overhangs, then through cooling channels in the rotor, then into said gap, then through the cooling ducts in the stator core into the coolant receiving region, and then through the cooling apparatus, the baffles both inhibiting escape of the gaseous coolant from the ends of said gap and inhibiting entry of the gaseous coolant into the gap through its ends, the flow of gaseous coolant around said cooling circuit being caused solely by the centrifugal force acting on the gaseous coolant in the cooling channels of the rotor.
2. A generator as claimed in claim 1, further comprising:
 - a cooling apparatus in fluid communication with the generator for cooling said gaseous coolant.
3. A generator as claimed in Claim 2, in which the cooling apparatus is positioned within the enclosure.
4. A generator as claimed in claim 2, wherein the coolant receiving region has two ends, and wherein the cooling apparatus comprises at least one cooler at each end of said coolant receiving region.

5. A generator as claimed in claim 1, wherein the superatmospheric pressure is at least 10 bar.
6. A generator as claimed in claim 1, wherein the gaseous coolant comprises a noble gas.
7. A generator as claimed in claim 6, wherein the gaseous coolant comprises helium.
8. A generator as claimed in claim 1, wherein the rotor comprises end portions which extend beyond the stator core, and wherein the rotor cooling channels comprise:
axially extending cooling channels communicating with the end portions of the rotor; and
radially extending cooling channels communicating between the axially extending cooling channels and said gap.
9. A generator as claimed in claim 1, wherein the stator core comprises radially extending cooling ducts each communicating between said gap and the receiving region outside the stator core.
10. A generator as claimed in claim 1, further comprising a bearing supporting the rotor, and wherein part of the flow from the cooling apparatus flows past the bearing when the generator is connected to cooling apparatus.
11. A generator as claimed in claim 1, further comprising:
an exciter; and
wherein part of the flow from the cooling apparatus flows past the exciter when the generator is connected to cooling apparatus.

12. A generator as claimed in claim 1, wherein the rotor axis is vertical.